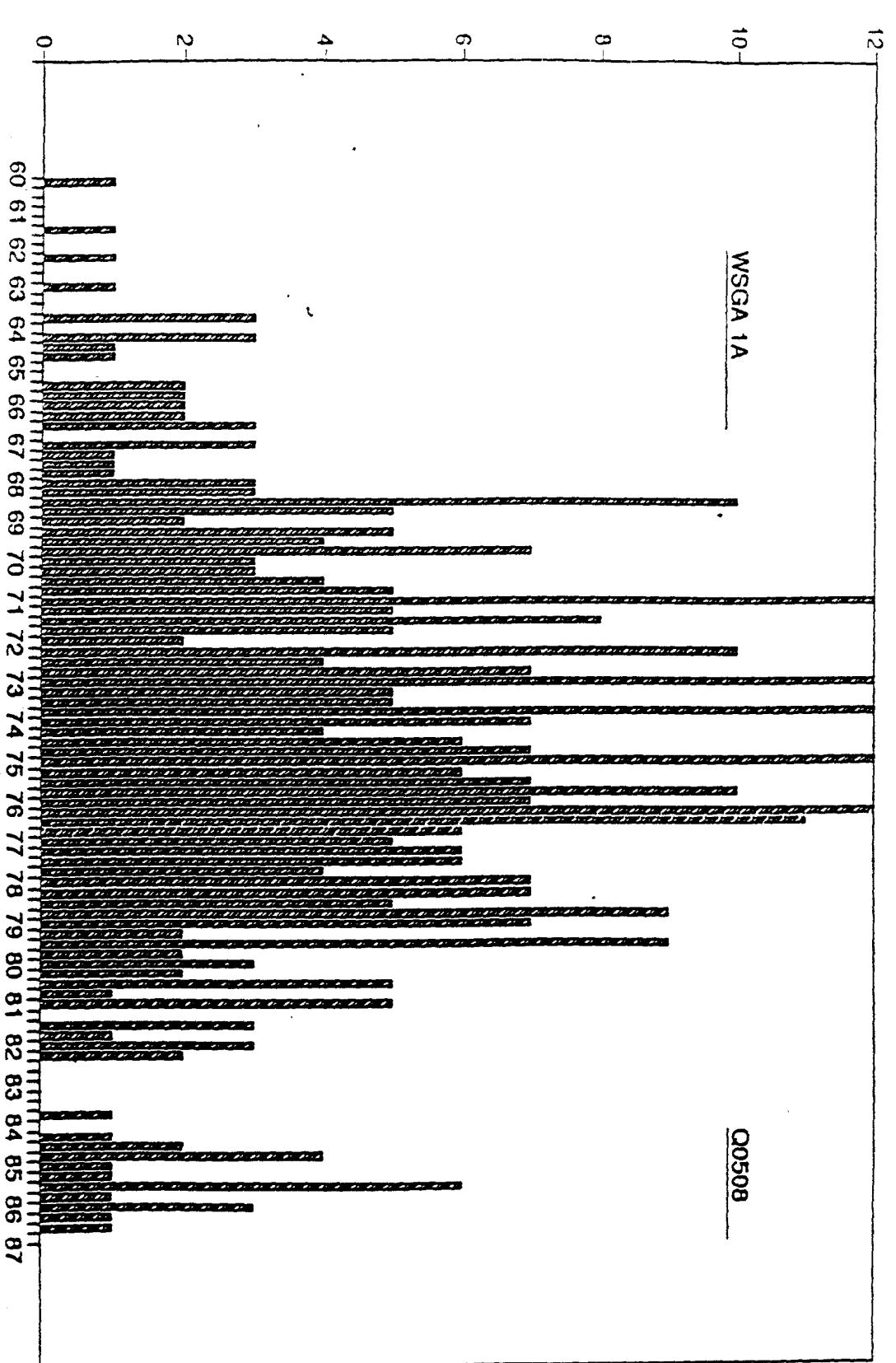


**Fig. 1 C18:1 Frequencies  
for 92EF (WSGA 1A X Q0508)**



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30

40

ATGGGTGCAGGTGGAAAGAATGCAAGTGTCTCCCTCCCA Fad2-D wt  
 ATGGGTGCAGGTGGAAAGAATGCAAGTGTCTCCCTCCCA Fad2-D (GA316) IMC129  
 ATGGGTGCAGGTGGAAAGAATGCAAGTGTCTCCCTCCCA Fad2-F wt  
 ATGGGTGCAGGTGGAAAGAATGCAAGTGTCTCCCTCCCA Fad2-F (TA515) Q508  
 ATGGGTGCAGGTGGAAAGAATGCAAGTGTCTCCCTCCCA Fad2-F (GA908) Q4275

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60

70

80

AAAAGTCTGAAACCGACAAACATCAAGCGCGTACCCCTGC GA Fad2-D wt  
 AAAAGTCTGAAACCGACAAACATCAAGCGCGTACCCCTGC GA Fad2-D (GA316) IMC129  
 AGAAGTCTGAAACCGACACCATCAAGCGCGTACCCCTGC GA Fad2-F wt  
 AGAAGTCTGAAACCGACACCATCAAGCGCGTACCCCTGC GA Fad2-F (TA515) Q508  
 AGAAGTCTGAAACCGACACCATCAAGCGCGTACCCCTGC GA Fad2-F (GA908) Q4275

90

100

110

120

GACACCGCCCTTCACTGTGGAGAACCTCAAGAAAGCAATC Fad2-D wt  
 GACACCGCCCTTCACTGTGGAGAACCTCAAGAAAGCAATC Fad2-D (GA316) IMC129  
 GACACCGCCCTTCACTGTGGAGAACCTCAAGAAAGCAATC Fad2-F wt  
 GACACCGCCCTTCACTGTGGAGAACCTCAAGAAAGCAATC Fad2-F (TA515) Q508  
 GACACCGCCCTTCACTGTGGAGAACCTCAAGAAAGCAATC Fad2-F (GA908) Q4275

130

140

150

160

CCACCGCAC T GT T CAAACGCTCGATCCCTCGCTCTTCT Fad2-D wt  
 CCACCGCAC T GT T CAAACGCTCGATCCCTCGCTCTTCT Fad2-D (GA316) IMC129  
 CCACCGCAC T GT T CAAACGCTCGATCCCTCGCTCTTCT Fad2-F wt  
 CCACCGCAC T GT T CAAACGCTCGATCCCTCGCCTTTCT Fad2-F (TA515) Q508  
 CCACCGCAC T GT T CAAACGCTCGATCCCTCGCTCTTCT Fad2-F (GA908) Q4275

170

180

190

200

CCTACCTCATCTGGGACATCATCATAGCCCTCCGTCTTA Fad2-D wt  
 CCTACCTCATCTGGGACATCATCATAGCCCTCCGTCTTA Fad2-D (GA316) IMC129  
 CCTACCTCATCTGGGACATCATCATAGCCCTCCGTCTTA Fad2-F wt  
 CCTACCTCATCTGGGACATCATCATAGCCCTCCGTCTTA Fad2-F (TA515) Q508  
 CCTACCTCATCTGGGACATCATCATAGCCCTCCGTCTTA Fad2-F (GA908) Q4275

210

220

230

240

CTACGGTCGCCACCACTTACTTCCCTCTCCCTCACCCCT Fad2-D wt  
 CTACGGTCGCCACCACTTACTTCCCTCTCCCTCACCCCT Fad2-D (GA316) IMC129  
 CTACGGTCGCCACCACTTACTTCCCTCTCCCTCACCCCT Fad2-F wt  
 CTACGGTCGCCACCACTTACTTCCCTCTCCCTCACCCCT Fad2-F (TA515) Q508  
 CTACGGTCGCCACCACTTACTTCCCTCTCCCTCACCCCT Fad2-F (GA908) Q4275

250

260

270

280

CTCTCCCTACTTCGCCCTCTCTACTTGGGCCCTGCCAGG Fad2-D wt  
 CTCTCCCTACTTCGCCCTCTCTACTTGGGCCCTGCCAGG Fad2-D (GA316) IMC129  
 CTCTCCCTACTTCGCCCTCTCTACTTGGGCCCTGCCAGG Fad2-F wt  
 CTCTCCCTACTTCGCCCTCTCTACTTGGGCCCTGCCAGG Fad2-F (TA515) Q508  
 CTCTCCCTACTTCGCCCTCTCTACTTGGGCCCTGCCAGG Fad2-F (GA908) Q4275

FIG. 2A

290                    300                    310                    320

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281 GCT GCG TCC TAACC GGCGT CTGGGT CATAG CCC ACC ACT G Fad2-D wt  
 281 GCT GCG TCC TAACCC GGCGT CTGGGT CATAG CCC ACC AAG TG Fad2-D (GA316) IMC129  
 281 GGT GCG TCC TAACC GGCGT CTGGGT CATAG CCC ACC GAG TG Fad2-F wt  
 281 GGT GCG TCC TAACCC GGCGT CTGGGT CATAG CCC ACC GAG TG Fad2-F (TA515) Q508  
 281 GGT GCG TCC TAACC GGCGT CTGGGT CATAG CCC ACC GAG TG Fad2-F (GA908) Q4275

330                    340                    350                    360

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321 CGGCC ACC AC CGC CCT TCAGCG ACT ACC AGT GGG CTGGAC GAC Fad2-D wt  
 321 CGGCC ACC AC CGC CCT TCAGCG ACT ACC AGT GGG CTGGAC GAC Fad2-D (GA316) IMC129  
 321 CGGCC ACC AC CGC CCT TCAGCG ACT ACC AGT GGG CTGGAC GAC Fad2-F wt  
 321 CGGCC ACC AC CGC CCT TCAGCG ACT ACC AGT GGG CTGGAC GAC Fad2-F (TA515) Q508  
 321 CGGCC ACC AC CGC CCT TCAGCG ACT ACC AGT GGG CTGGAC GAC Fad2-F (GA908) Q4275

370                    380                    390                    400

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361 ACC GT CGG C CT CAT CTT CC ACT CCT C CTC G T C C T T Fad2-D wt  
 361 ACC GT CGG C CT CAT CTT CC ACT CCT C CTC G T C C T T Fad2-D (GA316) IMC129  
 361 ACC GT CGG T CT CAT CTT CC ACT CCT C CTC G T C C T T Fad2-F wt  
 361 ACC GT CGG T CT CAT CTT CC ACT CCT C CTC G T C C T T Fad2-F (TA515) Q508  
 361 ACC GT CGG T CT CAT CTT CC ACT CCT C CTC G T C C T T Fad2-F (GA908) Q4275

410                    420                    430                    440

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401 ACT T CT C C T G G A A G T A C A G T C A T C G A C G C C A C C A T C C A A Fad2-D wt  
 401 ACT T CT C C T G G A A G T A C A G T C A T C G A C G C C A C C A T C C A A Fad2-D (GA316) IMC129  
 401 ACT T CT C C T G G A A G T A C A G T C A T C G A C G C C A C C A T C C A A Fad2-F wt  
 401 ACT T CT C C T G G A A G T A C A G T C A T C G A C G C C A C C A T C C A A Fad2-F (TA515) Q508  
 401 ACT T CT C C T G G A A G T A C A G T C A T C G A C G C C A C C A T C C A A Fad2-F (GA908) Q4275

450                    460                    470                    480

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431 CACT GG C T C C C T C G A G A G A G A C G A A G T G T T G T C C C C A A G Fad2-D wt  
 431 CACT GG C T C C C T C G A G A G A G A C G A A G T G T T G T C C C C A A G Fad2-D (GA316) IMC129  
 431 CACT GG C T C C C T C G A G A G A G A C G A A G T G T T G T C C C C A A G Fad2-F wt  
 431 CACT GG C T C C C T C G A G A G A G A C G A A G T G T T G T C C C C A A G Fad2-F (TA515) Q508  
 431 CACT GG C T C C C T C G A G A G A G A C G A A G T G T T G T C C C C A A G Fad2-F (GA908) Q4275

490                    500                    510                    520

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481 AAG AAG T C A G A C A T C A A G T G G T A C G G C A A G T A C C T C A A C A Fad2-D wt  
 481 AAG AAG T C A G A C A T C A A G T G G T A C G G C A A G T A C C T C A A C A Fad2-D (GA316) IMC129  
 481 AAG AAG T C A G A C A T C A A G T G G T A C G G C A A G T A C C T C A A C A Fad2-F wt  
 481 AAG AAG T C A G A C A T C A A G T G G T A C G G C A A G T A C C A C A A C A Fad2-F (TA515) Q508  
 481 AAG AAG T C A G A C A T C A A G T G G T A C G G C A A G T A C C T C A A C A Fad2-F (GA908) Q4275

530                    540                    550                    560

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521 ACC C T T G G G A C G C A C C G T G A T G T T A A C G G T T C A G T T C A C Fad2-D wt  
 521 ACC C T T G G G A C G C A C C G T G A T G T T A A C G G T T C A G T T C A C Fad2-D (GA316) IMC129  
 521 ACC C T T G G G A C G C A C C G T G A T G T T A A C G G T T C A G T T C A C Fad2-F wt  
 521 ACC C T T G G G A C G C A C C G T G A T G T T A A C G G T T C A G T T C A C Fad2-F (TA515) Q508  
 521 ACC C T T G G G A C G C A C C G T G A T G T T A A C G G T T C A G T T C A C Fad2-F (GA908) Q4275

FIG. 2B

570

580

590

600

561 TCTCGGCTGGCCTTGTACTTAGCCTTCAACGTCCTCGGGG Fad2-D wt  
 561 TCTCGGCTGGCCTTGTACTTAGCCTTCAACGTCCTCGGGG Fad2-D (GA316) IMC129  
 561 TCTCGGCTGGCCTTGTACTTAGCCTTCAACGTCCTCGGGG Fad2-F wt  
 561 TCTCGGCTGGCCTTGTACTTAGCCTTCAACGTCCTCGGGG Fad2-F (TA515) Q508  
 561 TCTCGGCTGGCCTTGTACTTAGCCTTCAACGTCCTCGGGG Fad2-F (GA908) Q4275

610

620

630

640

601 AGACCTTACGACGGCGGCTTCGCTTGCCATTCCACCCCCA Fad2-D wt  
 601 AGACCTTACGACGGCGGCTTCGCTTGCCATTCCACCCCCA Fad2-D (GA316) IMC129  
 601 AGACCTTACGACGGCGGCTTCGCTTGCCATTCCACCCCCA Fad2-F wt  
 601 AGACCTTACGACGGCGGCTTCGCTTGCCATTCCACCCCCA Fad2-F (TA515) Q508  
 601 AGACCTTACGACGGCGGCTTCGCTTGCCATTCCACCCCCA Fad2-F (GA908) Q4275

650

660

670

680

641 ACGCTCCCCTACAAACGACCGGTGACCGTCTCCAGATAATA Fad2-D wt  
 641 ACGCTCCCCTACAAACGACCGGTGACCGTCTCCAGATAATA Fad2-D (GA316) IMC129  
 641 ACGCTCCCCTACAAACGACCGGTGACCGTCTCCAGATAATA Fad2-F wt  
 641 ACGCTCCCCTACAAACGACCGGTGACCGTCTCCAGATAATA Fad2-F (TA515) Q508  
 641 ACGCTCCCCTACAAACGACCGGTGACCGTCTCCAGATAATA Fad2-F (GA908) Q4275

690

700

710

720

681 CATCTCCGACGGCTGGCATCCTCGCCGTCTGCTACGGTCTC Fad2-D wt  
 681 CATCTCCGACGGCTGGCATCCTCGCCGTCTGCTACGGTCTC Fad2-D (GA316) IMC129  
 681 CATCTCCGACGGCTGGCATCCTCGCCGTCTGCTACGGTCTC Fad2-F wt  
 681 CATCTCCGACGGCTGGCATCCTCGCCGTCTGCTACGGTCTC Fad2-F (TA515) Q508  
 681 CATCTCCGACGGCTGGCATCCTCGCCGTCTGCTACGGTCTC Fad2-F (GA908) Q4275

730

740

750

760

721 TACCGCTACGGCTGTCCAAACGGAGTTGCCCTCGATGGTCT Fad2-D wt  
 721 TACCGCTACGGCTGTCCAAACGGAGTTGCCCTCGATGGTCT Fad2-D (GA316) IMC129  
 721 TTCCGTTACGCCGGCGCAGGGAGTGGCCCTCGATGGTCT Fad2-F wt  
 721 TTCCGTTACGCCGGCGCAGGGAGTGGCCCTCGATGGTCT Fad2-F (TA515) Q508  
 721 TTCCGTTACGCCGGCGCAGGGAGTGGCCCTCGATGGTCT Fad2-F (GA908) Q4275

770

780

790

800

761 GCTTCTACGGAGTCCCTCTTGATGTCAACGGGTTCT Fad2-D wt  
 761 GCTTCTACGGAGTCCCTCTTGATGTCAACGGGTTCT Fad2-D (GA316) IMC129  
 761 GCTTCTACGGAGTCCCGCTTCTGATGTCAATGGTTTCC Fad2-F wt  
 761 GCTTCTACGGAGTCCCGCTTCTGATGTCAATGGTTTCC Fad2-F (TA515) Q508  
 761 GCTTCTACGGAGTCCCGCTTCTGATGTCAATGGTTTCC Fad2-F (GA908) Q4275

810

820

830

840

801 AGTTTGATCACTTACTTGCAGCACACGGCATCCTCCCTG Fad2-D wt  
 801 AGTTTGATCACTTACTTGCAGCACACGGCATCCTCCCTG Fad2-D (GA316) IMC129  
 801 CGTGGTTGATCACTTACTTGCAGCACACGGCATCCTCCCTG Fad2-F wt  
 801 CGTGGTTGATCACTTACTTGCAGCACACGGCATCCTCCCTG Fad2-F (TA515) Q508  
 801 CGTGGTTGATCACTTACTTGCAGCACACGGCATCCTCCCTG Fad2-F (GA908) Q4275

FIG. 2C

850

860

870

880

841 CCTCACTATGACTCGTCTGAGTGGGATTGGTTGAGGGGAG Fad2-D wt  
 841 CCTCACTATGACTCGTCTGAGTGGGATTGGTTGAGGGGAG Fad2-D (GA316) IMC129  
 841 CCTCACTACGGATTCTCCGAGTGGGATTGGTTGAGGGGAG Fad2-F wt  
 841 CCTCACTACGGATTCTCCGAGTGGGATTGGTTGAGGGGAG Fad2-F (TA515) Q508  
 841 CCTCACTACGGATTCTCCGAGTGGGATTGGTTGAGGGGAG Fad2-F (GA908) Q4275

890

900

910

920

881 CTTTGGCCACCGTTGACAGAGACTACCGAATCTTGAACAA Fad2-D wt  
 881 CTTTGGCCACCGTTGACAGAGACTACCGAATCTTGAACAA Fad2-D (GA316) IMC129  
 881 CTTTGGCTACCGTTGACAGAGACTACCGAATCTTGAACAA Fad2-F wt  
 881 CTTTGGCTACCGTTGACAGAGACTACCGAATCTTGAACAA Fad2-F (TA515) Q508  
 881 CTTTGGCTACCGTTGACAGAGACTACCGAATCTTGAACAA Fad2-F (GA908) Q4275

930

940

950

960

921 GGTCTTCCACAATATCACGGACACGACGGTGGCGCATCAC Fad2-D wt  
 921 GGTCTTCCACAATATCACGGACACGACGGTGGCGCATCAC Fad2-D (GA316) IMC129  
 921 GGTCTTCCACAATATTACCGACACGACGGTGGCGCATCAT Fad2-F wt  
 921 GGTCTTCCACAATATTACCGACACGACGGTGGCGCATCAT Fad2-F (TA515) Q508  
 921 GGTCTTCCACAATATTACCGACACGACGGTGGCGCATCAT Fad2-F (GA908) Q4275

970

980

990

1000

961 CTGTTCTCGACCATTATCATGCGATGGAAAGCTA Fad2-D wt  
 961 CTGTTCTCGACCATTATCATGCGATGGAAAGCTA Fad2-D (GA316) IMC129  
 961 CTGTTCTCCACGATGCCGCATTATCACGGCATGGAAAGCTA Fad2-F wt  
 961 CTGTTCTCCACGATGCCGCATTATCACGGCATGGAAAGCTA Fad2-F (TA515) Q508  
 961 CTGTTCTCCACGATGCCGCATTATCACGGCATGGAAAGCTA Fad2-F (GA908) Q4275

1010

1020

1030

1040

1001 CGAAGGGGATAAAAGCCGATACTGGGAGAGTATTATCAGTT Fad2-D wt  
 1001 CGAAGGGGATAAAAGCCGATACTGGGAGAGTATTATCAGTT Fad2-D (GA316) IMC129  
 1001 CCAAGGGGATAAAAGCCGATACTGGGAGAGTATTATCAGTT Fad2-F wt  
 1001 CCAAGGGGATAAAAGCCGATACTGGGAGAGTATTATCAGTT Fad2-F (TA515) Q508  
 1001 CCAAGGGGATAAAAGCCGATACTGGGAGAGTATTATCAGTT Fad2-F (GA908) Q4275

1050

1060

1070

1080

1041 CGATGGGACGCCGGTGGTTAACGGCATGTTGGAGGGAGGC Fad2-D wt  
 1041 CGATGGGACGCCGGTGGTTAACGGCATGTTGGAGGGAGGC Fad2-D (GA316) IMC129  
 1041 CGATGGGACGCCGGTGGTTAACGGCATGTTGGAGGGAGGC Fad2-F wt  
 1041 CGATGGGACGCCGGTGGTTAACGGCATGTTGGAGGGAGGC Fad2-F (TA515) Q508  
 1041 CGATGGGACGCCGGTGGTTAACGGCATGTTGGAGGGAGGC Fad2-F (GA908) Q4275

1090

1100

1110

1120

1081 AAGGAGTGTATCTATGTGGAACCGGACAGGCAAGGTGAGA Fad2-D wt  
 1081 AAGGAGTGTATCTATGTGGAACCGGACAGGCAAGGTGAGA Fad2-D (GA316) IMC129  
 1081 AAGGAGTGTATCTATGTGGAACCGGACAGGCAAGGTGAGA Fad2-F wt  
 1081 AAGGAGTGTATCTATGTGGAACCGGACAGGCAAGGTGAGA Fad2-F (TA515) Q508  
 1081 AAGGAGTGTATCTATGTGGAACCGGACAGGCAAGGTGAGA Fad2-F (GA908) Q4275

FIG. 2D

1130

1140

1150

1121 AGAAAAGGTGTTCTGGTACAAACAATAAGTTATCA  
1121 AGAAAAGGTGTTCTGGTACAAACAATAAGTTATGA  
1121 AGAAAAGGTGTTCTGGTACAAACAATAAGTTATGA  
1121 AGAAAAGGTGTTCTGGTACAAACAATAAGTTATCA  
1121 AGAAAAGGTGTTCTGGTACAAACAATAAGTTATGA

Fad2-D wt

Fad2-D (GA316) TMC129

Fad2-F wt

Fad2-F (TA515) Q508

Fad2-F (GA908) Q4275

FIG. 2E

10

20

1 Met Gly Ala Gly Gly Arg Met Gln Val Ser Pro Pro Ser Lys Lys Ser Glu Thr Asp Asn Fad2-D wt  
 1 Met Gly Ala Gly Gly Arg Met Gln Val Ser Pro Pro Ser Lys Lys Ser Glu Thr Asp Asn Fad2-D (GA316) IMC129  
 1 Met Gly Ala Gly Gly Arg Met Gln Val Ser Pro Pro Ser Lys Lys Ser Glu Thr Asp Thr Fad2 F wt  
 1 Met Gly Ala Gly Gly Arg Met Gln Val Ser Pro Pro Ser Lys Lys Ser Glu Thr Asp Thr Fad2-F (TAS15) Q508  
 1 Met Gly Ala Gly Gly Arg Met Gln Val Ser Pro Pro Ser Lys Lys Ser Glu Thr Asp Thr Fad2-F (GA908) Q4275

30

40

61 Ile Lys Arg Val Pro Cys Glu Thr Pro Pro Phe Thr Val Gly Glu Leu Lys Lys Ala Ile Fad2-D wt  
 61 Ile Lys Arg Val Pro Cys Glu Thr Pro Pro Phe Thr Val Gly Glu Leu Lys Lys Ala Ile Fad2-D (GA316) IMC129  
 61 Ile Lys Arg Val Pro Cys Glu Thr Pro Pro Phe Thr Val Gly Glu Leu Lys Lys Ala Ile Fad2-F wt  
 61 Ile Lys Arg Val Pro Cys Glu Thr Pro Pro Phe Thr Val Gly Glu Leu Lys Lys Ala Ile Fad2-F (TAS15) Q508  
 61 Ile Lys Arg Val Pro Cys Glu Thr Pro Pro Phe Thr Val Gly Glu Leu Lys Lys Ala Ile Fad2-F (GA908) Q4275

50

60

121 Pro Pro His Cys Phe Lys Arg Ser Ile Pro Arg Ser Phe Ser Tyr Leu Ile Trp Asp Ile Fad2-D wt  
 121 Pro Pro His Cys Phe Lys Arg Ser Ile Pro Arg Ser Phe Ser Tyr Leu Ile Trp Asp Ile Fad2-D (GA316) IMC129  
 121 Pro Pro His Cys Phe Lys Arg Ser Ile Pro Arg Ser Phe Ser Tyr Leu Ile Trp Asp Ile Fad2-F wt  
 121 Pro Pro His Cys Phe Lys Arg Ser Ile Pro Arg Ser Phe Ser Tyr Leu Ile Trp Asp Ile Fad2-F (TAS15) Q508  
 121 Pro Pro His Cys Phe Lys Arg Ser Ile Pro Arg Ser Phe Ser Tyr Leu Ile Trp Asp Ile Fad2-F (GA908) Q4275

70

80

181 Ile Ile Ala Ser Cys Phe Tyr Tyr Val Ala Thr Thr Tyr Phe Pro Leu Leu Pro His Pro Fad2-D wt  
 181 Ile Ile Ala Ser Cys Phe Tyr Tyr Val Ala Thr Thr Tyr Phe Pro Leu Leu Pro His Pro Fad2-D (GA316) IMC129  
 181 Ile Ile Ala Ser Cys Phe Tyr Tyr Val Ala Thr Thr Tyr Phe Pro Leu Leu Pro His Pro Fad2-F wt  
 181 Ile Ile Ala Ser Cys Phe Tyr Tyr Val Ala Thr Thr Tyr Phe Pro Leu Leu Pro His Pro Fad2-F (TAS15) Q508  
 181 Ile Ile Ala Ser Cys Phe Tyr Tyr Val Ala Thr Thr Tyr Phe Pro Leu Leu Pro His Pro Fad2-F (GA908) Q4275

90

100

241 Leu Ser Tyr Phe Ala Trp Pro Leu Tyr Trp Ala Cys Gln Gly Cys Val Leu Thr Gly Val Fad2-D wt  
 241 Leu Ser Tyr Phe Ala Trp Pro Leu Tyr Trp Ala Cys Gln Gly Cys Val Leu Thr Gly Val Fad2-D (GA316) IMC129  
 241 Leu Ser Tyr Phe Ala Trp Pro Leu Tyr Trp Ala Cys Gln Gly Cys Val Leu Thr Gly Val Fad2-F wt  
 241 Leu Ser Tyr Phe Ala Trp Pro Leu Tyr Trp Ala Cys Gln Gly Cys Val Leu Thr Gly Val Fad2-F (TAS15) Q508  
 241 Leu Ser Tyr Phe Ala Trp Pro Leu Tyr Trp Ala Cys Gln Gly Cys Val Leu Thr Gly Val Fad2-F (GA908) Q4275

110

120

301 Trp Val Ile Ala His Glu Cys Gly His His Ala Phe Ser Asp Tyr Gln Trp Leu Asp Asp Fad2-D wt  
 301 Trp Val Ile Ala His Lys Cys Gly His His Ala Phe Ser Asp Tyr Gln Trp Leu Asp Asp Fad2-D (GA316) IMC129  
 301 Trp Val Ile Ala His Glu Cys Gly His His Ala Phe Ser Asp Tyr Gln Trp Leu Asp Asp Fad2-F wt  
 301 Trp Val Ile Ala His Glu Cys Gly His His Ala Phe Ser Asp Tyr Gln Trp Leu Asp Asp Fad2-F (TAS15) Q508  
 301 Trp Val Ile Ala His Glu Cys Gly His His Ala Phe Ser Asp Tyr Gln Trp Leu Asp Asp Fad2-F (GA908) Q4275

130

140

361 Thr Val Gly Leu Ile Phe His Ser Phe Leu Leu Val Pro Tyr Phe Ser Trp Lys Tyr Ser Fad2-D wt  
 361 Thr Val Gly Leu Ile Phe His Ser Phe Leu Leu Val Pro Tyr Phe Ser Trp Lys Tyr Ser Fad2-D (GA316) IMC129  
 361 Thr Val Gly Leu Ile Phe His Ser Phe Leu Leu Val Pro Tyr Phe Ser Trp Lys Tyr Ser Fad2-F wt  
 361 Thr Val Gly Leu Ile Phe His Ser Phe Leu Leu Val Pro Tyr Phe Ser Trp Lys Tyr Ser Fad2-F (TAS15) Q508  
 361 Thr Val Gly Leu Ile Phe His Ser Phe Leu Leu Val Pro Tyr Phe Ser Trp Lys Tyr Ser Fad2 F (GA908) Q4275

150

160

421 His Arg Arg His His Ser Asn Thr Gly Ser Leu Glu Arg Asp Glu Val Phe Val Pro Lys Fad2-D wt  
 421 His Arg Arg His His Ser Asn Thr Gly Ser Leu Glu Arg Asp Glu Val Phe Val Pro Lys Fad2-D (GA316) IMC129  
 421 His Arg Arg His His Ser Asn Thr Gly Ser Leu Glu Arg Asp Glu Val Phe Val Pro Lys Fad2-F wt  
 421 His Arg Arg His His Ser Asn Thr Gly Ser Leu Glu Arg Asp Glu Val Phe Val Pro Lys Fad2-F (TA515) Q508  
 421 His Arg Arg His His Ser Asn Thr Gly Ser Leu Glu Arg Asp Glu Val Phe Val Pro Lys Fad2-F (GA908) Q4275

170

180

481 Lys Lys Ser Asp Ile Lys Trp Tyr Gly Lys Tyr Leu Asn Asn Pro Leu Gly Arg Thr Val Fad2-D wt  
 481 Lys Lys Ser Asp Ile Lys Trp Tyr Gly Lys Tyr Leu Asn Asn Pro Leu Gly Arg Thr Val Fad2-D (GA316) IMC129  
 481 Lys Lys Ser Asp Ile Lys Trp Tyr Gly Lys Tyr Leu Asn Asn Pro Leu Gly Arg Thr Val Fad2-F wt  
 481 Lys Lys Ser Asp Ile Lys Trp Tyr Gly Lys Tyr His Asn Asn Pro Leu Gly Arg Thr Val Fad2-F (TA515) Q508  
 481 Lys Lys Ser Asp Ile Lys Trp Tyr Gly Lys Tyr Leu Asn Asn Pro Leu Gly Arg Thr Val Fad2-F (GA908) Q4275

190

200

541 Met Leu Thr Val Gln Phe Thr Leu Gly Trp Pro Leu Tyr Leu Ala Phe Asn Val Ser Gly Fad2-D wt  
 541 Met Leu Thr Val Gln Phe Thr Leu Gly Trp Pro Leu Tyr Leu Ala Phe Asn Val Ser Gly Fad2-D (GA316) IMC129  
 541 Met Leu Thr Val Gln Phe Thr Leu Gly Trp Pro Leu Tyr Leu Ala Phe Asn Val Ser Gly Fad2-F wt  
 541 Met Leu Thr Val Gln Phe Thr Leu Gly Trp Pro Leu Tyr Leu Ala Phe Asn Val Ser Gly Fad2-F (TA515) Q508  
 541 Met Leu Thr Val Gln Phe Thr Leu Gly Trp Pro Leu Tyr Leu Ala Phe Asn Val Ser Gly Fad2-F (GA908) Q4275

210

220

601 Arg Pro Tyr Asp Gly Gly Phe Ala Cys His Phe His Pro Asn Ala Pro Ile Tyr Asn Asp Fad2-D wt  
 601 Arg Pro Tyr Asp Gly Gly Phe Ala Cys His Phe His Pro Asn Ala Pro Ile Tyr Asn Asp Fad2-D (GA316) IMC129  
 601 Arg Pro Tyr Asp Gly Gly Phe Ala Cys His Phe His Pro Asn Ala Pro Ile Tyr Asn Asp Fad2-F wt  
 601 Arg Pro Tyr Asp Gly Gly Phe Ala Cys His Phe His Pro Asn Ala Pro Ile Tyr Asn Asp Fad2-F (TA515) Q508  
 601 Arg Pro Tyr Asp Gly Gly Phe Ala Cys His Phe His Pro Asn Ala Pro Ile Tyr Asn Asp Fad2-F (GA908) Q4275

230

240

661 Arg Glu Arg Leu Gln Ile Tyr Ile Ser Asp Ala Gly Ile Leu Ala Val Cys Tyr Gly Leu Fad2-D wt  
 661 Arg Glu Arg Leu Gln Ile Tyr Ile Ser Asp Ala Gly Ile Leu Ala Val Cys Tyr Gly Leu Fad2-D (GA316) IMC129  
 661 Arg Glu Arg Leu Gln Ile Tyr Ile Ser Asp Ala Gly Ile Leu Ala Val Cys Tyr Gly Leu Fad2-F wt  
 661 Arg Glu Arg Leu Gln Ile Tyr Ile Ser Asp Ala Gly Ile Leu Ala Val Cys Tyr Gly Leu Fad2-F (TA515) Q508  
 661 Arg Glu Arg Leu Gln Ile Tyr Ile Ser Asp Ala Gly Ile Leu Ala Val Cys Tyr Gly Leu Fad2-F (GA908) Q4275

250

260

721 Tyr Arg Tyr Ala Ala Val Gln Gly Val Ala Ser Met Val Cys Phe Tyr Gly Val Pro Leu Fad2-D wt  
 721 Tyr Arg Tyr Ala Ala Val Gln Gly Val Ala Ser Met Val Cys Phe Tyr Gly Val Pro Leu Fad2-D (GA316) IMC129  
 721 Phe Arg Tyr Ala Ala Ala Gln Gly Val Ala Ser Met Val Cys Phe Tyr Gly Val Pro Leu Fad2-F wt  
 721 Phe Arg Tyr Ala Ala Ala Gln Gly Val Ala Ser Met Val Cys Phe Tyr Gly Val Pro Leu Fad2-F (TA515) Q508  
 721 Phe Arg Tyr Ala Ala Ala Gln Gly Val Ala Ser Met Val Cys Phe Tyr Gly Val Pro Leu Fad2-F (GA908) Q4275

270

280

781 Leu Ile Val Asn Gly Phe Leu Val Leu Ile Thr Tyr Leu Gln His Thr His Pro Ser Leu Fad2-D wt  
 781 Leu Ile Val Asn Gly Phe Leu Val Leu Ile Thr Tyr Leu Gln His Thr His Pro Ser Leu Fad2-D (GA316) IMC129  
 781 Leu Ile Val Asn Gly Phe Leu Val Leu Ile Thr Tyr Leu Gln His Thr His Pro Ser Leu Fad2-F wt  
 781 Leu Ile Val Asn Gly Phe Leu Val Leu Ile Thr Tyr Leu Gln His Thr His Pro Ser Leu Fad2-F (TA515) Q508  
 781 Leu Ile Val Asn Gly Phe Leu Val Leu Ile Thr Tyr Leu Gln His Thr His Pro Ser Leu Fad2-F (GA908) Q4275

841 Pro His Tyr Asp Ser Ser Glu Trp Asp Trp Leu Arg Gly Ala Leu Ala Thr Val Asp Arg Fad2-D wt  
 841 Pro His Tyr Asp Ser Ser Glu Trp Asp Trp Leu Arg Gly Ala Leu Ala Thr Val Asp Arg Fad2-D (GA316) IMC129  
 841 Pro His Tyr Asp Ser Ser Glu Trp Asp Trp Leu Arg Gly Ala Leu Ala Thr Val Asp Arg Fad2-F wt  
 841 Pro His Tyr Asp Ser Ser Glu Trp Asp Trp Leu Arg Gly Ala Leu Ala Thr Val Asp Arg Fad2-F (TA515) Q508  
 841 Pro His Tyr Asp Ser Ser Glu Trp Asp Trp Leu Arg Gly Ala Leu Ala Thr Val Asp Arg Fad2-F (GA908) Q4275

901 Asp Tyr Gly Ile Leu Asn Lys Val Phe His Asn Ile Thr Asp Thr His Val Ala His His Fad2-D wt  
 901 Asp Tyr Gly Ile Leu Asn Lys Val Phe His Asn Ile Thr Asp Thr His Val Ala His His Fad2-D (GA316) IMC129  
 901 Asp Tyr Gly Ile Leu Asn Lys Val Phe His Asn Ile Thr Asp Thr His Val Ala His His Fad2-F wt  
 901 Asp Tyr Gly Ile Leu Asn Lys Val Phe His Asn Ile Thr Asp Thr His Val Ala His His Fad2-F (TA515) Q508  
 901 Asp Tyr Glu Ile Leu Asn Lys Val Phe His Asn Ile Thr Asp Thr His Val Ala His His Fad2-F (GA908) Q4275

961 Leu Phe Ser Thr Met Pro His Tyr His Ala Met Glu Ala Thr Lys Ala Ile Lys Pro Ile Fad2-D wt  
 961 Leu Phe Ser Thr Met Pro His Tyr His Ala Met Glu Ala Ala Thr Lys Ala Ile Lys Pro Ile Fad2-D (GA316) IMC129  
 961 Leu Phe Ser Thr Met Pro His Tyr His Ala Met Glu Ala Thr Lys Ala Ile Lys Pro Ile Fad2-F wt  
 961 Leu Phe Ser Thr Met Pro His Tyr His Ala Met Glu Ala Ala Thr Lys Ala Ile Lys Pro Ile Fad2-F (TA515) Q508  
 961 Leu Phe Ser Thr Met Pro His Tyr His Ala Met Glu Ala Ala Thr Lys Ala Ile Lys Pro Ile Fad2-F (GA908) Q4275

1021 Leu Gly Glu Tyr Tyr Gln Phe Asp Gly Thr Pro Val Val Lys Ala Met Trp Arg Glu Ala Fad2-D wt  
 1021 Leu Gly Glu Tyr Tyr Gln Phe Asp Gly Thr Pro Val Val Lys Ala Met Trp Arg Glu Ala Fad2-D (GA316) IMC129  
 1021 Leu Gly Glu Tyr Tyr Gln Phe Asp Gly Thr Pro Val Val Lys Ala Met Trp Arg Glu Ala Fad2-F wt  
 1021 Leu Gly Glu Tyr Tyr Gln Phe Asp Gly Thr Pro Val Val Lys Ala Met Trp Arg Glu Ala Fad2-F (TA515) Q508  
 1021 Leu Gly Glu Tyr Tyr Gln Phe Asp Gly Thr Pro Val Val Lys Ala Met Trp Arg Glu Ala Fad2-F (GA908) Q4275

1081 Lys Glu Cys Ile Tyr Val Glu Pro Asp Arg Gln Gly Glu Lys Lys Gly Val Phe Trp Tyr Fad2-D wt  
 1081 Lys Glu Cys Ile Tyr Val Glu Pro Asp Arg Gln Gly Glu Lys Lys Gly Val Phe Trp Tyr Fad2-D (GA316) IMC129  
 1081 Lys Glu Cys Ile Tyr Val Glu Pro Asp Arg Gln Gly Glu Lys Lys Gly Val Phe Trp Tyr Fad2-F wt  
 1081 Lys Glu Cys Ile Tyr Val Glu Pro Asp Arg Gln Gly Glu Lys Lys Gly Val Phe Trp Tyr Fad2-F (TA515) Q508  
 1081 Lys Glu Cys Ile Tyr Val Glu Pro Asp Arg Gln Gly Glu Lys Lys Gly Val Phe Trp Tyr Fad2-F (GA908) Q4275

1141 Asn Asn Lys Leu ter  
 1141 Asn Asn Lys Leu ter

Fad2-D wt  
 Fad2-D (GA316) IMC129  
 Fad2-F wt  
 Fad2-F (TA515) Q508  
 Fad2-F (GA908) Q4275